

WHAT IS CLAIMED IS:

1 1. A vibrator motor comprising
2 a stationary piece; and
3 a moving piece hingedly secured to the stationary piece, the moving
4 piece being hinged to the stationary piece such that the moving piece itself does not
5 generate mechanical spring forces under the influence of an electromagnetic field.

1 2. The vibrator motor of claim 1, further comprising
2 an electrical coil; and
3 a movement control system connected to the stationary piece and the
4 moving piece, the movement control system having at least one spring and at least one
5 device for adjusting tension in the spring;
6 whereby the moving piece is moved by electromagnetic fields
7 generated by the electrical coil.

1 3. The vibrator motor of claim 2 wherein the coil is on the stationary
2 piece, the motor further comprising a driver on the moving piece for connection to a
3 motor load.

1 4. The vibrator motor of claim 1 comprising a hinge holder having a
2 first surface that retains the moving piece axially while still allowing the moving piece
3 to rotate.

1 5. The vibrator motor of claim 4 wherein the hinge holder has a second
2 surface that biases the moving piece radially while still allowing the moving piece to
3 rotate.

1 6. The vibrator motor of claim 1 comprising a hinge holder having a
2 surface that biases the moving piece radially while still allowing the moving piece to
3 rotate.

1 7. The vibrator motor of claim 2 wherein the driver is crimped to the
2 moving piece.

1 8. The vibrator motor of claim 1 wherein the stationary piece has a
2 circular shape at a first end of the stationary piece, and the moving piece forms a circular
3 shaped opening at a first end of the moving piece, the circular shaped end of the stationary
4 piece fitting inside of the circular shaped opening of the moving piece.

1 9. The vibrator motor of claim 8 wherein the movement control system
2 is located at a second end of the moving piece.

1 10. The vibrator motor of claim 1 wherein the movement control system
2 includes a screw having screw threads and a head, the screw being adjustably threaded
3 in an opening in the stationary piece;

4 the screw passing freely through an opening in the moving piece, the
5 stationary piece opening being located on one side of the moving piece opening and the
6 screw head being located on the other side of the moving piece opening,

7 the movement control system further comprising a first spring
8 between the stationary piece and the moving piece, and a second spring between the
9 moving piece and the screw head.

10 11. The vibrator motor of claim 1 comprising a coil bobbin on the
11 stationary piece around which the coil is wound, the coil bobbin also having an extension
12 to which the movement control system is connected.

13 12. The vibrator motor of claim 3 wherein the movement control system
14 is connected to the driver of the moving piece.

15 13. The vibrator motor of claim 1 comprising low friction insert between
16 the stationary and moving pieces where the stationary and moving pieces are hinged.

17 14. The vibrator motor of claim 1 comprising at least one grease channel
18 where the moving piece is hingedly secured to the stationary piece.

3 15. A holder for a hinge having an axis, the hinge including a stationary
4 piece and a moving piece hingedly secured to the stationary piece, the holder comprising
5 a first surface that secures the stationary piece to a case or the like,
6 the first surface not interfering with movement of the moving piece;
7 a second surface that retains the moving piece axially with respect
8 to the stationary piece; and
9 a third surface that presses the moving piece radially with respect to
10 the stationary piece.

1 16. A coil bobbin for a motor having a stationary piece, a moving piece
2 and a movement control system, the bobbin comprising
3 a winding portion for wrapping wire around the bobbin, the winding
4 portion having an internal opening through which the stationary piece can be inserted; and
5 an arm extending from the winding portion to which the movement
6 control system can be connected.

1 17. A hair clipper comprising
2 a case having at least one attachment point for securing the motor;
3 a stationary blade on the case;
4 a moving blade adjacent the stationary blade, the moving blade being
5 adapted for reciprocation across the moving blade; and

6 a motor secured to the case at the attachment point, the motor
7 including,

8 a stationary piece having a coil,
9 a moving piece hingedly secured to the stationary piece, the moving
10 piece being hinged to the stationary piece at one end such that the moving piece itself
11 does not generate mechanical spring forces under the influence of an electromagnetic
12 field,

13 a driver on the other end of the moving piece, the driver and the
14 moving blade being coupled for movement of the moving blade; and

15 a movement control system connected to the stationary piece and the
16 moving piece, the movement control system having at least one spring and at least one
17 device for adjusting tension in the spring.

18. The hair clipper of claim 17 comprising a hinge holder having a first
2 surface that retains the moving piece axially while still allowing the moving piece to
3 rotate.

19. The hair clipper of claim 18 wherein the hinge holder has a second
2 surface that biases the moving piece radially while still allowing the moving piece to
3 rotate.

1 20. The hair clipper of claim 17 comprising a hinge holder having a
2 surface that biases the moving piece radially while still allowing the moving piece to
3 rotate.

1 21. The hair clipper of claim 17 comprising a coil bobbin on the
2 stationary piece around which the coil is wound, the coil bobbin also having an extension
3 to which the movement control system is connected.

1 22. A method for manufacturing a hair clipper comprising
2 molding a case having at least one motor attachment point ,
3 retaining a stationary blade on the case and locating a reciprocating
4 blade adjacent the stationary blade,
5 assembling a motor having a driver; and
6 installing the assembled motor in the case and securing it at the
7 attachment point, the driver causing the reciprocating blade to reciprocate when the motor
8 is operated.